

IN THE CLAIMS:

Cancel claims 20 to 44 and add the following claims:

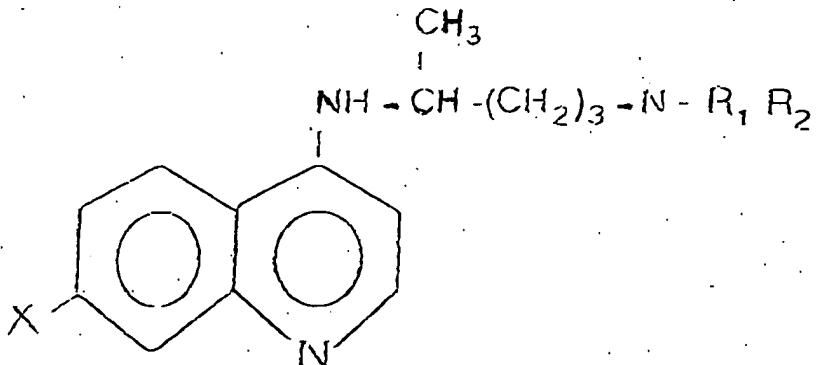
145-60. A complex comprised of at least one negatively charged nucleic acid and at least one positively charged polymeric conjugate with the bond therebetween being electrostatic in nature, the polymeric conjugate containing a polylysine formed from monomers having free NH_3^+ groups,

at least 10% of free NH_3^+ groups of the said polylysine are substituted by residues which ~~can be~~ are protonated in a weakly acid medium causing destabilization of cell membranes,

and optionally at least one free NH_3^+ group of the said polylysine is substituted by a molecule with a recognition signal recognized by a cell membrane receptor,

with the proviso that all the free NH_3^+ groups of the said polylysine make up at least 30% of the number of monomers of the skeleton of the polymeric conjugate,

wherein said residues causing destabilization of cell membranes in a weakly acid medium belong to the family of quinolines of the formula:



in which R₁ is hydrogen, R₂ is -(CH₂)_n-CO₂-H, X is hydrogen or chlorine and n is an integer from 1 to 10, wherein said recognition signal is selected from the group consisting of:

a) simple osides selected from the group consisting of α or β conformers of 2-deoxy, 2-amino or 2-deoxy, 2-acetamido neutral monosaccharides; α or β conformers of glycuronic acid derivatives of neutral monosaccharides; α or β conformers of L-iduronic acid, of keto-deoxy-octonic acid, of N-acetyl neuraminic acid, or of N-glycoloyl-neuraminic acid; and α or β conformers of neutral 6-deoxy monosaccharides;

b) a disaccharide selected from the group consisting of lactose and mannopyranosyl α -6-mannopyranose,

c) complex osides selected from the group consisting of Lewis^a, Lewis^b, Lewis^c, oligomannosides and oligolactosamines and

d) peptides.

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Claim 61. The complex of claim 60 wherein said quinolines are selected from the group consisting of 7-chloro-4-(amino-1-methylbutylamino)-quinoline, N⁴-(7-chloro-4-quinolinyl)-1,4-pentanediamine, 8-(4-amino-1-methylbutylamino)-6-methoxyquinoline (primaquine), N⁴-(6-methoxy-8-quinolinyl)-1,4-pentanediamine, and pyridines selected from the group consisting of nicotinic acid and quinolenic acid and pterines.

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Claim 62. The complex of claim 60 wherein the free NH₃⁺ groups of the polylysine are substituted with a non-charged gluconyl residue causing a reduction in the positive charge of the polymeric conjugate which facilitates salting out of the nucleic acids upon

dissociation of the complex.

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Claim 63. The complex of claim 60 wherein said recognition-signal is a peptide chosen from the group consisting of
 (a) anti-inflammatory peptides recognized by receptors of the vascular wall.

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- (b) ligand peptides of integrins,
- (c) chemiotactic factors and
- (d) peptide hormones.

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Claim 64. The complex of claim 60 wherein:

are

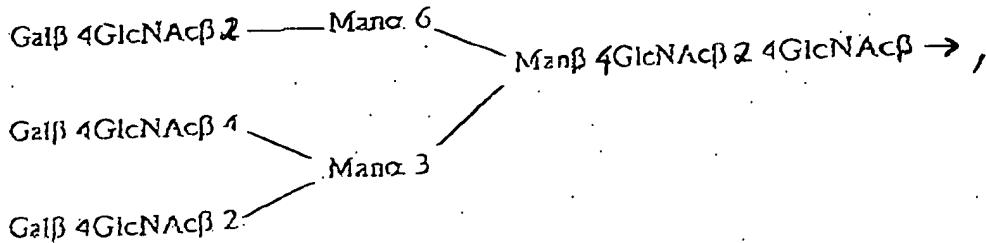
G - the monosaccharide is selected from the group consisting of galactose, mannose, fucose, glucose, ribose, xylose and rhamnose and

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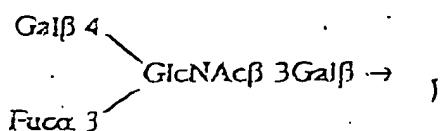
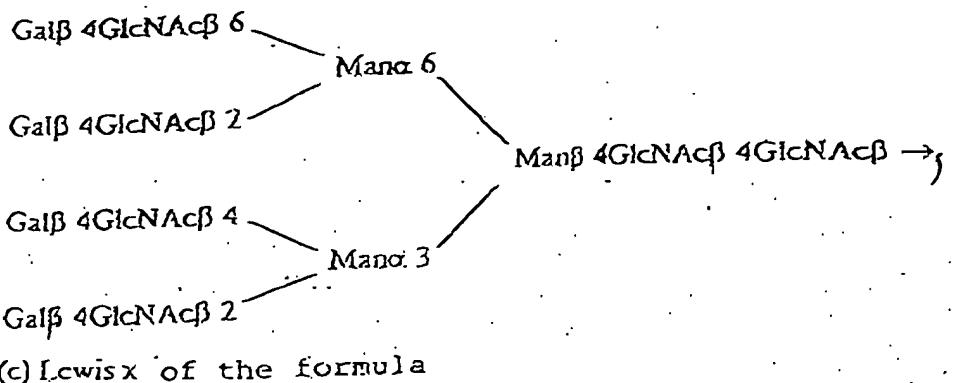
Complex Osides are

- the oligosaccharide is selected from the group consisting of

- (a) Asialo-oligoside of the type of triantennar lactosamine of

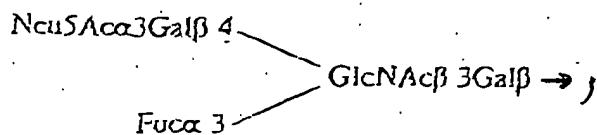


(b) Asialo-oligoside of the type of tetraantennar lactosamin of the formula



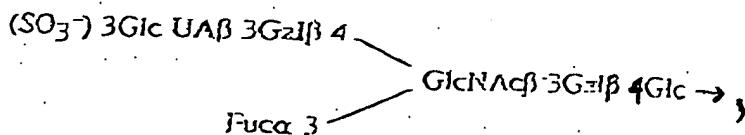
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(d) Lewis x sialyl of the formula



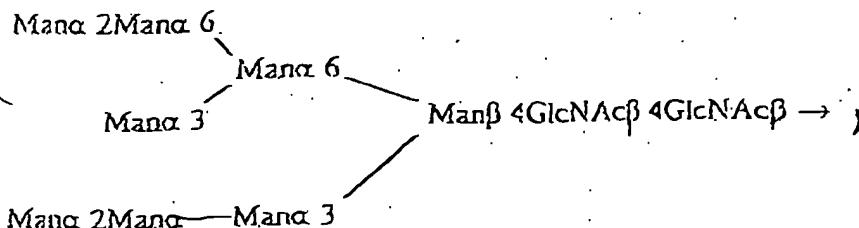
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(e) Sulphated Lewis x derivative (HNK1) of the formula

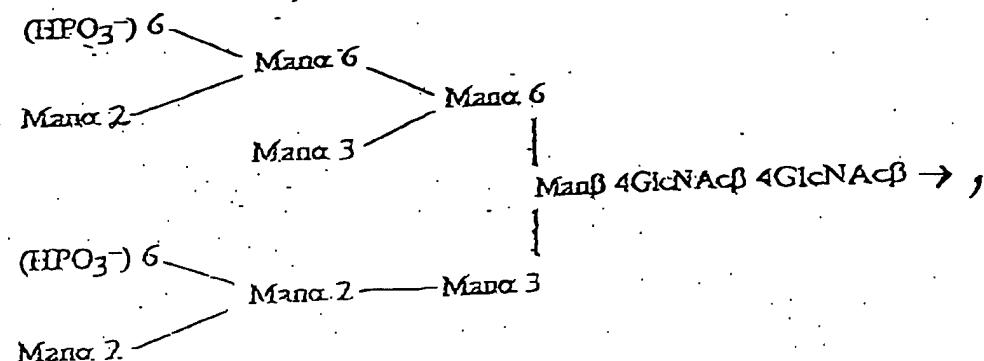


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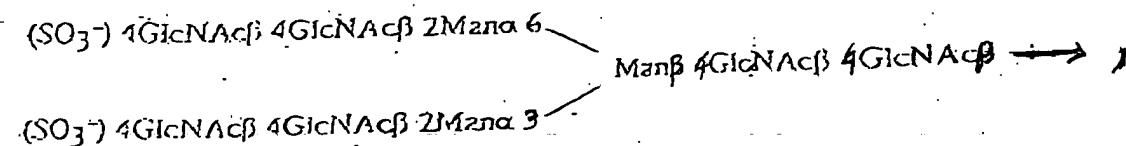
(f) Oligomannoside of the formula



(g) Phosphorylated oligomannoside



(h) Oligosaccharide of the type of sulphated lactosamine of the formula



- i. Lactose,
- j. $\text{Fuc}\alpha 2\text{Gal}\beta 3$ ($\text{fuc}\alpha 4$) $\text{GlcNAc}\beta 1\text{Gal}\beta 3\text{Glc}$,
- k. $\text{Fuc}\alpha 4$ ($\text{Ga}\beta 3$) $\text{GlcNAc}\beta 3\text{Gal}\beta$ and
- l. $\text{Man}\alpha 6\text{-man}$.

Claim 50. The complex of claim 54 wherein the peptides are selected from the group consisting of

selected from the group consisting of

- vasodilator intestinal polypeptide (VIP)
HSDAVFTDNYTRLRKQMAVKKYLNSILN-NH₂ (SEQ ID NO: 1)
- atrial natriuretic polypeptide (ANP).

SLRRSSCFGGRMDRIGAQSGLGCNSFRY (SEQ ID No: 3)

- lipocortin

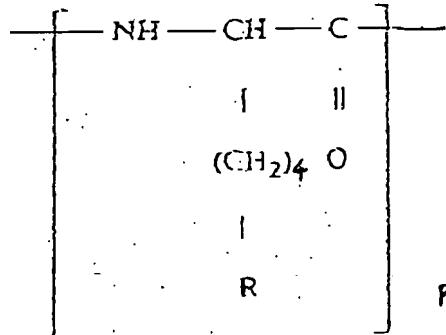
HDMNKVLDL (SEQ ID No: 4)

- bradykinin

RPPGFSPER (SEQ IS No: 5);

peptides of integrins, peptide hormones and chemotactics factors.

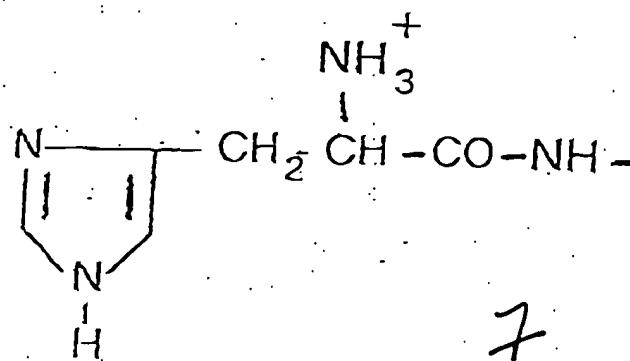
751 *451*
Claim *66*. The complex of claim *66* wherein the polymeric conjugate has the formula:



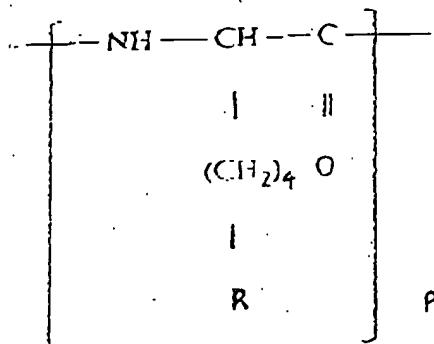
wherein:

- *p* is an integer from 15 to 900,
- 10 to 45% of the radical *R* being a residue with an imidazole nucleus.
- 10 to 90% of *R* being free NH_3^+ groups,
- and optionally 0 to 45% of *R* being $-\text{NH}-\text{CO}-\text{(CHOH)}_m-\text{R}_1$, *m* is an integer from 2 to 15, and *R*₁ is hydrogen or alkyl of 1 to 15 carbon atoms.

B 55 *ST 7*
The complex of claim *66* wherein *R* is a residue with an imidazole nucleus of the formula:



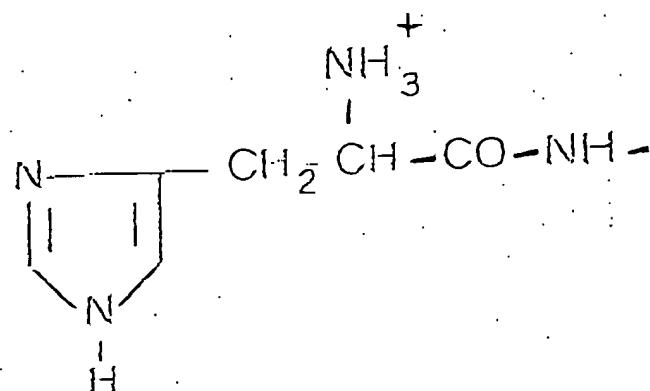
Claim 68. The complex of claim 51 wherein the polymeric conjugate has the following formula:



wherein:

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- p is an integer from 15 to 900,
- 10% to 45% of R is a residue having an imidazole nucleus and optionally a free NH3+, R has the formula:



or

- 30% to 90% of the number of R, having free NH3+, and 0 to 45%

of R are substituted by a molecule which constitutes a recognition signal by a cell membrane receptor,

with the proviso that all the free NH_3^+ functions make up at least 30% of the number of monomer units of the polymeric skeleton of the above mentioned polymeric conjugate.

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Claim 69. A complex according to claim 50 wherein the nucleic acid is selected from the group consisting of:

a) marker genes and
b) genes with a therapeutic purpose.

Claim 70. Positively charged polymeric conjugate containing a polylysine formed from monomers having free NH_3^+ groups:

at least 10% of the free NH_3^+ groups of the said polylysine are substituted by residues which ~~can be~~ ^{are} protonated in a weakly acid medium causing destabilization of cell membranes,

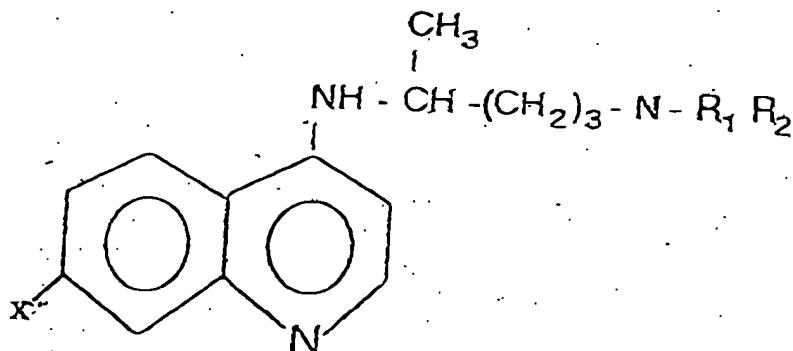
and optionally some of the free NH_3^+ groups of the said polylysine can be substituted by a molecule with a recognition signal recognized by a cell membrane receptor,

with the proviso that all the free NH_3^+ groups of the said polylysine make up at least 30% of the number of monomers of the skeleton of the polymeric conjugate,

wherein said residues causing destabilization of cell membranes in a weakly acid medium belong:

- to the family of quinolines of the formula

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in which R_1 is hydrogen, R_2 is $(\text{CH}_2)_n\text{-CO}_2\text{-H}$, X is hydrogen or chlorine and n is an integer from 1 to 10, wherein said recognition signal is selected from the group consisting of:

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- simple osides selected from the group consisting of α or β conformers of 2-deoxy, of 2-amino or of 2-deoxy, 2-acetamido neutral monosaccharides; α or β conformers of glycuronic acid derivatives of neutral monosaccharides; α or β conformers of L-iduronic acid, of keto-deoxy-octonic acid, of N-acetyl-neuraminic acid, or of N-glycoloyl-neuraminic acid; and α or β conformers of neutral 6-deoxy monosaccharides;

- a disaccharide selected from the group consisting of lactose and mannopyranosyl- α -6-mannopyranose,

and complex osides selected from the group consisting of Lewis^a, Lewis^b, Lewis^c, oligomannosides and oligolactosamines, and peptides.

Claim 71. The positively charged polymeric conjugate according to claim 50 wherein the free NH_3^+ groups of the polylysine are substituted with a non-charged residue causing a reduction in the positive charge of the polymeric conjugate which facilitates

salting out of the nucleic acids upon dissociation of the complex,
said non-charged residue being a gluconyl.

Claim ~~58~~ 13. The composition comprising the complex of claim ~~60~~
and an inert pharmaceutical carrier.

Claim ~~58~~ 14. A method of transfecting cultured cells comprising
G incubating said cells in the presence of ~~the~~ composition of claim ~~72~~
under conditions wherein said composition enters said cells, and
the nucleic acid comprised in the complex of said composition is
released to transfect culture cells.

Claim ~~58~~ 15. The method of claim ~~72~~ wherein the cells are
selected from the group consisting of

- cells of hematopoietic strains;
- dendritic cells;
- liver cells;
- skeletal muscle cells;
- skin cells;
- fibroblasts,
- keratinocytes,
- dendritic cells,
- melanocytes;
- cells of the vascular walls;
- endothelial;
- smooth muscle;
- epithelial cells of the respiratory tract;
- cells of the central nervous system;
- cancerous cells; and